

NASA Update live broadcast

Neil Armstrong marks Apollo anniversary at Glenn

Apollo 11 anniversary reminds Agency to stay diligent.

BY DOREEN B. ZUDELL

On the 35th anniversary of the Apollo 11 mission, Glenn welcomed back Neil Armstrong, who began his NASA career at Glenn as a test pilot and later became the first human to set foot on the Moon. Armstrong sat among an audience of Center employees during a NASA Update, broadcast live from the Electric Propulsion Laboratory (EPL) on July 20.

Reflecting on the anniversary of the Apollo 11 mission, Administrator Sean O'Keefe called today's exploration objectives "similar to Apollo but in a much more advanced way." He affirmed and Center Director Dr. Julian Earls reiterated, that in this transitional time for the Agency, it is important to stay positive and remain "diligent" and "persistent" in living out the NASA Values.

Amidst a backdrop of environment simulation chambers, O'Keefe praised Glenn employees for their long history of technological achievements. "People don't realize the basic technology research objectives we have to achieve before reaching our goals," O'Keefe said. "Work being performed right here in the EPL is on the cutting edge of what is needed for NASA's exploration agenda."

During a video outlining *NASA's Exploration: Earth, Moon, Mars, and Beyond*, Armstrong talked about NASA's new vision for exploration and stressed that the initiative is "not a race but a journey." During the question and answer session, Armstrong added that he believes "there are no barriers we can't overcome to sustain extended periods of time on the Moon."

O'Keefe and Earls addressed a variety of questions from the Glenn audience and across the Agency. ♦



Above: O'Keefe and Earls during the live Update.

Right: The Glenn audience applauds Armstrong on the 35th anniversary of Apollo 11.



Photos by Doreen Zudell

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Silver Snoopy Awards

This award is the Astronauts' personal tribute to the single efforts of individuals.

Astronauts Joan Higginbotham and Donald Pettit recently presented Silver Snoopy Awards to 11 Glenn or Glenn-associated civil servant and support service contract employees.

The award is the astronauts' personal tribute to individuals whose single effort or long-term outstanding performance has contributed to flight safety and mission success—the main priorities for human space flight. The recognition focuses on efforts that enhance the probability of mission success, such as improvements in design; administration; technology; production techniques; business systems; flight and/or system safety; or error identification, correction, or prevention.

The following employees were acknowledged for outstanding support of NASA's space program.

Dr. Angel Abbud-Madrid, Colorado School of Mines, as principal co-investigator of the Mist experiment that flew as part of Combustion Module-2 (CM-2) on STS-107.

Dr. Juan Agui, Microgravity Division, as the project scientist for Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions (InSPACE) experiment that was conducted on the International Space Station (ISS) in a Microgravity Science Glovebox.

Dr. Kelly Carney, Structures and Acoustics Division, for his efforts on the Agencywide Ballistic Impact Analysis Team, which led to successful predictions of orbiter wing leading edge damage caused by impacts of external tank foam.

Michael Doherty, Microgravity Division, as the project manager of the Physics of Colloids in Space (PCS) experiment series, which was critical to the development and operation of the Express PCS experiment on ISS.

Daryl Edwards, Engineering Development Division, for providing Government oversight of the large contracted engineering development effort for the ISS Fluids Combustion Facility.

James Fincannon, Power and Propulsion Office, as part of the ISS System Power Analysis for Capability Evaluation (SPACE) team that developed the Glenn SPACE code, which was used to verify the ability of the ISS power system to supply efficient power for mission and vehicle needs.

Karen Hughes, Systems Engineering Division, for work as the configuration management specialist for the CM-2, which flew on STS-107 in the Space Hab Module.

Dr. Nathan Jacobson, Materials Division, in providing high-temperature chemistry expertise to the investigation of reinforced carbon-carbon (RCC) leading edge material issues for the Agency's Return to Flight efforts.

Thomas Kerslake, Power and Propulsion Office, as a member of the team that

developed the Glenn SPACE code, which was used to verify the ability of the ISS power system to supply efficient power for mission and vehicle needs.

Duane Revilock, Structures and Acoustics Division, in the development of a unique ballistic test capability to characterize the complex mechanisms associated with the external tank foam impact on RCC orbiter leading edges in the Agency's Return to Flight efforts.



Photo by David Frate

Two Silver Snoopy winners received their awards during the Strategic Research to Enable NASA's Exploration Missions conference and workshop in Cleveland. Pictured, left to right, are Astronaut Pettit, Steve Simons (6700), Yuan, Abbud-Madrid, and Ann Over (6729).



C-2004-852

Photo by Michelle Murphy

Pictured, back row, left to right, Williams, Kerslake, Revilock, Doherty, Carney, and Fincannon; front row, Agui, Jacobson, Hughes, Astronaut Higginbotham, Zaretsky, and Edwards.

Continued on next page

Headquarters' Appointments

Administrator Sean O'Keefe recently appointed a number of people to key positions at Headquarters and across the Agency:

Retired Marine Brigadier General **Michael Wholley** has been named NASA general counsel to succeed **Paul Pastorek** who returned to private law practice with a firm in New Orleans. Pastorek was a key member of the NASA senior management team and a trusted advisor to Administrator O'Keefe for the past 2 1/2 years. Wholley joins NASA after a distinguished career of public service in the Marine Corps, including a tour of duty as a naval aviator flying combat missions in Vietnam. After law school, Wholley held a series of military legal positions that lead to an assignment as staff judge advocate to the Commandant of the Marine Corps/Director, Judge Advocate Division.

John (Jack) Mannix, former associate general counsel for general law, has been named deputy general counsel. **Keith Sefton**, chief of staff to the general counsel, has been named deputy general counsel for Management and Administration.

Alphonso Diaz, former center director of NASA Goddard, has been named associate administrator of NASA's new Science Mission Directorate. **Edward Weiler** becomes Goddard's new center director.

Orlando Figueroa, former deputy chief engineer for Systems Engineering, has been named deputy associate administrator for Programs for the Science Mission Directorate. **Alison McNally**, former associate director of Goddard, has been named deputy associate administrator for Management in the new directorate.

Clint Herbert, former special projects manager in the Office of Security, has been named deputy assistant administrator of the Office of Security and Safeguards.

Dr. Neal Burns, former director of the Center for Brand Research at the University of Texas at Austin, has been named special assistant to the Administrator and acting chief of Strategic Communications.

NASA Dryden Director Kevin Petersen named **Steven Schmidt**, former special assistant to Administrator O'Keefe, deputy director of Dryden. Schmidt previously served as executive director for the President's Space Commission. Schmidt began his career at Dryden in November 1994 where he was involved in various programs including the X-33, X-38, X-43A, F-15 ACTIVE, and SR-71.



Diaz



Figueroa



Pastorek



Roe



Schmidt



Weiler

NASA Langley Director Roy Bridges, Jr., named **Lesla Roe** his deputy Director. Roe, who formerly served as Langley's associate director for Business Management, brings to the position a blend of educational, technical, and leadership qualifications, as well as a broad perspective gained from working at multiple NASA centers. ♦

Web dialogue on Transformation

Administrator Sean O'Keefe recently introduced a new Web page to engage NASA employees in an online Agencywide dialogue regarding NASA's Transformation.

To access the site, visit <http://www.insidenasa.nasa.gov> and go to the center box titled NASA Transformation. Once there, users can read the latest news regarding the Agency and post reactions to updated topics. ♦

Silver Snoopy awards



Continued from page 2

Glenn L. Williams, Engineering Development Division, for leadership and technical expertise resulting in the design and development of the major avionics packages for the two largest, most complex space flight experiments (CM-1 and CM-2) ever flown in the Spacelab and SPACE-HAB modules.

Dr. Zeng-Guang Yuan, Microgravity Division, as the deputy project scientist for Laminar Soot Processes (LSP) 1 and LSP 2 that flew on *Columbia* in 1997 and again on STS-107 in 2003.

Edwin Zaretsky, Structures and Acoustics Division, for expertise in tribology of mechanical systems that have been instrumental in identifying potential shuttle rudder and speed brake actuators failure modes. ♦



Photo by Doreen B. Zudell

Journey thank-you

Nearly 500 guests attended a thank-you luncheon on July 1 to recognize the contributions of employees, sponsors, and community members who helped make Journey to Tomorrow—Glenn's recent open house and technology showcase—a success. The event was hosted at the Picnic Grounds by Center Director Dr. Julian Earls and External Program Director John Hairston, and facilitated by Journey to Tomorrow Project Manager David DeFelice. In addition to a personalized certificate, each guest received a water bottle carrier as a token of appreciation. Pictured is Greg Fedor (6700/ZIN) receiving a certificate from Director of Programs and Projects Dr. Arun Sehra.

Star gazing

Glenn's Visitor Center (VC), in collaboration with Schuele Planetarium of the Lake Erie Nature & Science Center and the Cuyahoga Astronomical Association, presented "Star Gazing" on June 19 from 10 a.m. to 11 p.m. that evening. Guest speaker Jay Reynolds, Schuele Planetarium director, hosted presentations that appealed to all ages. Telescopes were set up outside the VC. About 850 visitors attended the daylong event.



Photo courtesy of Jay Reynolds



Space exploration

Nearly 400 attendees from academia, industry, and government participated in the conference and workshop Strategic Research to Enable NASA's Exploration Missions, held in Cleveland June 22 and 23. The event, hosted by Glenn and the National Center for Microgravity Research on Fluids and Combustion, focused on a transformation underway in NASA's Biological and Physical Research Enterprise to support the "Vision for Space Exploration" and other future missions. Details of the event can be found at <http://www.ncmr.org/events/fluids2004/>.

Heart walk

Twenty team members from Team NASA participated in the Cleveland American Heart Walk, held downtown at Voinovich Park on June 13. Team NASA raised \$6,085.29, third best for the Team category. This 1- to 3-mile walk benefit raised a total of \$353,145, which will go towards research and education for heart disease and stroke, the number 1 and number 3 killers in the Nation.





Ask the Director

Q: When will the Center be running the Dual Career Ladder process? We keep hearing that it is "coming soon" but it never seems to arrive.

A. 6/15/04 The Dual Career Ladder (DCL) process provides a path to high-level responsibility based on the personal creativity and scientific contributions of our scientists and engineers. The process is therefore of very high value to the Center, and it is important that it be conducted fairly and efficiently. I have received much input regarding the fairness of the process and the amount of time and effort required of all levels of the staff to implement the process. I have already decided to eliminate the Chief Scientist's Candidate Evaluation Panel from the process. The chief scientist's primary role will now be to insure consistent implementation of DCL across the directorates. I have also asked our Chief Scientist Tony Strazisar to review the DCL process and to implement improvements to the process. Tony has just completed a white paper I requested addressing the strengths and weaknesses of the current process and recommending changes to the process. This white paper was developed with input from the Directors Of for the former 2000, 5000, 6000, and 7000

directorates, from division chiefs and some branch chiefs within the 5000 directorate, and from Tony's personal experience in all levels of the DCL process since its institution. I will be meeting with Tony before the end of June to review his recommendations. Tony will also meet with the Directors Of to discuss suggested changes. He will then work with the Office of Human Resources and Workforce Planning to update the Center Level Procedure for the DCL process and will issue the call letter to begin the process. I anticipate that you can expect to see the call letter issued in July.*

**Some of the dates in the response to this Q&A have been revised. As a result, employees can expect to see the call letter issued in August. The above question was chosen by the Director as a sampling from the Ask the Director Web site. The entire column from the Ask the Director Web site can be viewed under Corporate Focus on Glenn's internal homepage (WING).*

News Notes

LESA MEETING: LESA/IFPTE, Local 28, will hold its next monthly membership meeting on Wednesday, August 11, at noon in the Employee Center.

WILKINS' RETIREMENT PARTY: A retirement luncheon will be held on Friday, August 27 from 11 a.m. to 6 p.m. at the Picnic Grounds. A luncheon of vegetable and beef lasagna, baked chicken, meatballs, antipasto salad, dessert, and beverage will be served at noon. The cost of the luncheon is \$19, which includes a donation for a gift. Ticket deadline for the luncheon is close of business, August 16. For information, contact Mary Moore, 216-433-3039 or Betsy Smith, 216-433-8793.

AFGE MEETING: AFGE Local 2182 will hold its next monthly membership meeting on Wednesday, September 1, at 5 p.m. at Denny's Restaurant. All members are encouraged to attend.

SATURDAY VISITOR CENTER EVENT: Glenn's Visitor Center will present a NASA spinoffs event on Saturday, August 21. The "Why on Earth Do We Spend Tax Dollars in Space?" theme will showcase NASA technologies and how the "NASA Vision: to improve life here, to extend life to there, and to find life beyond" benefits everyday life here on Earth. Visitors will learn how Glenn has been behind some of the exciting successes

Exchange Corner

It's time for the Exchange Store's Annual Back to School Sale. Patrons can save 20 percent off all clothing from Monday, August 16 to Friday, August 20. NASA shirts and hats make great back to school apparel.

in the scientific world and has won numerous R&D 100 awards. The VC is open from 10 a.m. to 3 p.m. Visitors can register for the 11 a.m. or 1 p.m. presentations by calling 216-433-9653.

SUMMER FIESTA: Back by popular demand, Glenn's Summer Fiesta 2004 is scheduled for Friday, September 10, at 5 p.m. at the Picnic Grounds. The event will feature Spanish cuisine, dance contests, door prizes, and raffles. The cost is \$12 for adults and \$6 for children ages 4 to 11. For tickets, contact Anna Falcon, 216-433-8993 or Danny Rodriguez, 216-433-2778.



Honor Awards

NASA's Associate Administrator for Aeronautics Dr. J. Victor Lebacqz will be the keynote speaker at the 2004 NASA Honor Awards Ceremony. The event will be held on September 1 at 10:30 a.m. in the DEB Auditorium.

Continued on page 11

Well wishes for former Center Director

Colleagues from NASA, industry, and academia gathered at OAI on June 18 to celebrate Donald Campbell's 10 years of dedicated service to NASA. Campbell, who served as Glenn's Center Director from 1994 to 2003, most recently headed NASA's Special Projects Office for Nuclear Power Systems. He retired from NASA on April 4, 2004. Family and friends were among the guests to present special mementos and wish Campbell well. Pictures include (1) left to right, former Acting Deputy Director Gerald Barna, Associate Director Robert Fails (background), Campbell, and (wife) Helen Campbell, in a light moment. (2) Campbell with NASA retirement plaque. (3) Center Director Dr. Julian Earls (standing, right) adds his congratulatory comments as the guests applaud.



C-2004-851



C-2004-850



C-2004-849

Photos by Marvin Smith

"Of Ashes and Atoms" debut is a great success



C-2004-847

Two years in the making, but well worth the wait! That was the consensus expressed in the applause of nearly 700 Erie County residents and guests who viewed *Of Ashes and Atoms: A Documentary on the NASA Plum Brook Station Reactor Facility*. The video premiered at the Sandusky State Theatre on July 14.

Producer and director Jim Polaczynski (IDI), Imaging Technology Center, and supporting staff used fire as a unifying theme to connect the past to the present at the facility's location—the Firelands. Footage dating back to 1941, including a farming community, TNT plant, and personal interviews, enabled the audience to experience the unique history of this facility.

Jack Crooks, one of the reactor facility retirees interviewed for the 90-minute documentary, showered praise on the production crew. "Very few times does one get to relive his or her youth. Many of us can do that through the video," Crooks said.

The documentary enabled both NASA employees and Sandusky residents who had no involvement with the reactor to gain a sense of kinship as they learned about the experiences of the talented people who built and operated it. "I had the privilege of working with a number of (Plum Brook employees) earlier in my career," explained Steve Wiersma, Engineering Development Division. "Although most of them did not work in the reactor area, they certainly shared the same 'esprit de corps' as those who did. All spoke fondly of their years there and it certainly showed through last night. Thanks to the NASA history folks the Plum Brook legacy has been preserved."

Steve Garber, NASA Headquarters History Office, expressed similar sentiments

after attending the reactor retiree reception and viewing the video. He extended congratulations for "the first of its kind" feature-length, documentary film professionally produced under the auspices of the NASA History Program. The team did a tremendous job. I look forward to working with Jim and Kevin (Coleman, Glenn's History Officer) to release this video in our NASA History Series."

Editor's Note: a viewing of the documentary is planned at Glenn with date to be determined. A pictorial history of the reactor by Dr. Mark Bowles of History Enterprises, Inc., and Bob Arrighi, Glenn archivist, will be released soon.



C-2004-848

Above, far right, Polaczynski is congratulated by, left, Arrighi, Dennis Brown (IDI) LTID, videographer; and Mike Blotzer, chief, Environmental Management Office. Right, the audience at Sandusky State Theatre.

Photos by Marvin Smith

Alternative fuels propel cleaner running vehicles

Alternative fuel is used in all diesel-powered vehicles and other equipment such as generators.

BY DOREEN B. ZUDELL

Glenn has a strong reputation for its research in reducing harmful emissions in the Nation's aircraft engines. But right here on Lab, the Center is committed to reducing emissions on its own fleet of vehicles.

Spurred by energy acts in the early 1990s and the Executive Order 13148, *Greening of Government Through Leadership and Environmental Management*, in 1996 that called for the government to set the pace and standards for using alternative fuels, Glenn began its efforts toward meeting these directives in fiscal year 1997.

"The Center entered into a partnership with East Ohio Gas, which included installing a natural gas fueling station and converting and acquiring vehicles that could run on natural gas," explained Vehicles Operations Officer Tim Debth, Logistics and Technical Information Division (LTID).

While natural gas usage in vehicles increased on Lab, the Center was also investigating other alternative fuel opportunities. In January 2003, B20 Biodiesel (20 percent soy methyl and 80 percent low-sulfur diesel fuel) was chosen for vehicle and facility use. Biodiesel is a cleaner burning fuel for diesel engines that is produced from renewable resources such as soybean oil. Glenn's 40-foot-long AeroSpace Environmental Traveling Exhibit Bus, for example, operates on this fuel.

"Some of our delivery truck drivers, as well as other employees who work by our loading docks, complained about nauseating fumes from diesel engines," said Fuel Specialist Todd Strawser, (IDI) LTID. "We tested various percentages of soy fuel in a delivery truck and discovered that it worked as efficiently as

petroleum diesel fuel but with a substantial decrease in emissions."

"With B20, no conversion of vehicles is necessary," Strawser explained. "We now use it in all diesel-powered vehicles and facility equipment such as electrical generators. While the recent cost of petroleum diesel fuel has been increasing, the cost of biodiesel has been decreasing because of increased production."

LTID established a third alternative fuel program in September 2003 by converting an unleaded gasoline storage tank and installing a fuel dispenser for new E85 fuel. E85 is a mixture of 85 percent ethanol and 15 percent gasoline. Ethanol is a domestic, high-octane, renewable fuel produced by fermentation of plant sugars.

The Center now has four onsite fuel dispensers, which dispense compressed natural gas, unleaded gasoline, E85, and B20.

Glenn is taking yet another step toward economic use of alternative fuels. A leasing agreement with the General Services Administration (GSA) will enable the Center to upgrade its current vehicle fleet and meet mandated alternative fuel vehicle acquisition requirements. Currently, 75 percent of all new vehicle acquisitions must be an alternative fuel vehicle.

When the lease agreement with GSA is complete, about half of the Center's fleet of 160 vehicles, ranging from sedans and trucks to golf carts and snow plows, will run on alternative fuels.

"In the beginning it was hard to imagine meeting the government's requirements, partly because the fuels were not readily available," Debth said. "But thanks to



Photo by Doreen B. Zudell

Pictured are Todd Strawser, left, and Tim Debth by the onsite fuel dispensers.

determination and creativity, along with the support of our employees who have accepted the changes, we're exceeding our goals."

To continue setting the pace for usage of alternative fuels, Glenn is looking at other sources, even hydrogen, which Strawser says is "abundant, efficient, clean, and natural." Electric-powered vehicles are also being investigated. ♦

New payroll system online

On August 8, NASA will transition to the Department of the Interior's Federal Personnel/Payroll System (FPPS) as a part of the ePayroll project. All civil service employees will be affected by the change. To prepare for this transition, the ePayroll team presented several employee briefings, published a series of articles in *Today@Glenn*, and created a brochure to explain the upcoming changes. To access these documents at the IFMP Web site at <http://cfo.grc.nasa.gov/ifmp/>, select the ePayroll menu option. Articles and other information can be found under the Documents option.

Additionally, an ePayroll Open House will be held on August 31, for employees to discuss questions or issues regarding the first leave and earnings statement from the FPPS. Time and location will be posted on the IFMP Web site. ♦

Chief engineer will promote engineering excellence

BY S. JENISE VERIS



Photo by S. Jenise Veris

Vega draws on inspiration provided by souvenirs, photos, and art (in background) created by his three sons to remind him to stretch his own talents.

The recent Columbia Accident Investigation Board's report has spurred a renewed commitment to ensure

the soundest approach for sustaining a high level of engineering and safety excellence across the Agency. At Glenn, Center Director Dr. Julian Earls has appointed Jose Vega to lead this effort as the new chief engineer.

Vega began his career in industry, where he served as district engineer for the Puerto Rico Power Authority. Since coming to the Center 21 years ago, he has held a variety of management positions in the Engineering and Technical Services Directorate and the Office of Safety and Engineering Management. Prior to his selection as chief engineer in January, Vega was deputy director of the Engineering and Technical Services Directorate.

While Vega considers himself a "hands-on" manager who works alongside his staff in the field, he realizes that his new position requires more time spent in high-level strategic planning. "My wife and I have always told our three sons to stretch beyond your comfort zone to broaden your intellect and expertise," Vega said. "I took my own advice when I accepted this new position."

Some of Vega's issues of interest and new tasks include the following:

- Defining how Glenn will implement the Agency's Independent Technical Authority Initiative, which will allow for an independent, objective process to help resolve conflicts that may arise between engineering and project management, (i.e., technical versus programmatic).
- Defining a more engineering-friendly dual-career ladder process. The process currently in place is designed primarily to recognize scientists. Very few engineers have had similar career opportunities, unless their work seeped into research areas. Vega hopes to work with Chief Scientist Anthony Strazisar on developing this area.
- Defining core competencies relative to engineering disciplines and applications.

As chief engineer, Vega is committed to elevating technical excellence while expanding opportunities for Glenn's engineering community. ♦

Summer learning

NASA offers students and educators unique and unparalleled opportunities for research and educational growth. This summer, Glenn's Educational Programs Office and Office of University Programs provide high school and college students as well as educators opportunities to experience NASA's technology firsthand. Here are some impressive numbers for the 2004 season:

Office of Educational Programs

Lewis' Educational and Research Collaborative Internship Program (LERCIP)

- ❑ College level: 176 college students and 2 high school teachers
- ❑ SHARP (Summer High School Apprentice Research Program): 39 students
- ❑ NASA Plus: 25 students
- ❑ NASA Engineering Technology Program: 11 students
- ❑ NASA Explorer School Workshops: 30 teachers

Some of the areas of interest in which the students are pursuing on Lab include business administration, computer science, chemistry, mechanical engineering, ceramics, and materials and structures.

Office of University Programs

NASA Faculty Fellowship Program (NFFP)

- ❑ 27 faculty
- ❑ 3 students
- ❑ 15 institutions represented

Undergraduate Student Research Program (USRP)

- ❑ 26 participants
- ❑ 21 institutions represented

Some areas of research on Lab for the NFFP and USRP include metal bonding to carbon/carbon composites, life prediction of turbine components; nonmaterial, nanolubricants for tribology, fuel reforming for solid oxide fuel; silicon-carbide sensors; and parametric analysis of gas turbine cycles. ♦

Solar sails could ride interplanetary winds

Solar sail technology, which needs no propellant, is a possible alternative to conventional propulsion systems for interplanetary flight.

BY S. JENISE VERIS

It was smooth sailing for the solar sail system design that recently endured a month-long series of tests in Glenn's Space Power Facility (SPF) at Plum Brook Station to validate structural performance. Solar sail technology, which needs no propellant, is a possible alternative to conventional propulsion systems for interplanetary flight.

A model by L'Garde, Inc. (Tustin, CA) is one of two solar sail technology designs currently funded under NASA's In-Space Propulsion (ISP) Program. The goal of the ISP program is to develop advanced propulsion technologies for use beyond Earth orbit that reduce trip times, spacecraft mass, and costs associated with NASA science missions to the outer planets, and other solar system destinations.

"Test hardware buildup began approximately 3 months prior to testing the 10-meter subscale model of L'Garde's striped-net sail and inflatable boom solar sail system," explained Jerry Carek, SPF manager. "Special gravity offloading structures and a custom-designed liquid nitrogen system were used to support the booms during deployment and chill them to spacelike temperatures. A 20-meter model will come in for testing next spring."

A team of engineers from L'Garde, Glenn, and NASA Langley conducted the series of tests on strength, stiffness, shape, and dynamic behavior of the solar sail system to advance the technology readiness level (TRL) toward a 6. Achieving TRL 6 requires testing in a "relevant environment" like the SPF, the world's largest space environment simulation chamber.

The series consisted of three tests:

- A solar sail boom deployment test, where the vacuum level was ramped down to simulate space. When the solar sail is unfolded, four booms are inflated

Photo by Wayne Wong

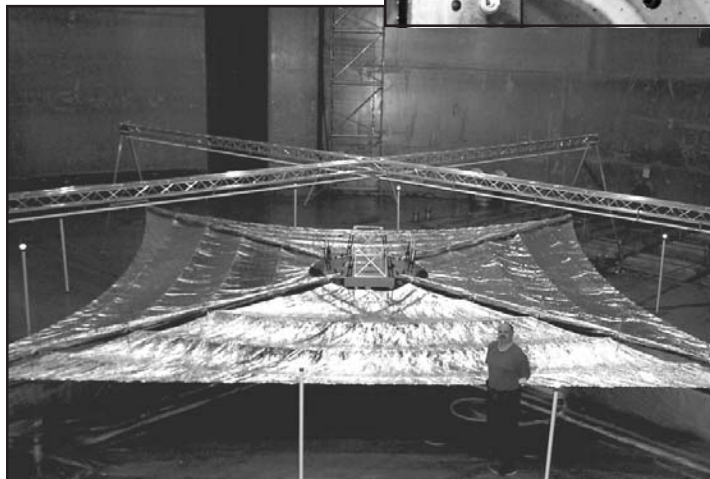


Photo by Jerry Carek

and deployed longitudinally (horizontally) to form a big "X". Once the booms get cold, they become rigid and no longer require inflation gas.

- A dynamics test with sail deployed to evaluate the thin, reflective structure that is propelled through space by sunlight, just as the wind pushes sailboats on Earth. The sails are made of very thin (2-micron-thick) Mylar material, with special coatings to maximize heat rejection to space. Mylar is commonly used in the electronics industry and consequently is readily available and affordable.
- A strength test to determine whether the booms will maintain their form in the hostile environment of space was performed. Tension cables were attached to each boom to apply push and pull stresses, simulating the load that is expected after deployment and exposure to the forces of the Sun (solar flux).

Earlier this year, a prototype 1-meter-sized solar sail developed by a team offering an alternative design, represented by



Pictured above is a 1-meter SRS solar sail model deployed and tested in the Tank 6 Vacuum Chamber at Lewis Field. Left, is the larger 10-meter L'Garde solar sail model that was tested in the Space Power Facility at Glenn's Plum Brook Station.

SRS Technologies (Huntsville, AL), completed solar thermal vacuum testing in Vacuum Facility 6 at Lewis Field. Wayne Wong, research engineer in the Thermal Energy Conversion Branch, led the effort that provided characterization data on space-qualified sail material exposed to spacelike conditions, including exposure to solar energy levels 4 times higher than that at low Earth orbit.

ISP is managed by NASA's Office of Space Science at Headquarters and implemented by NASA Marshall. The program is also supported by NASA's Ames, Glenn, Jet Propulsion Laboratory, Johnson, and Langley field centers.

"I am enthusiastic that Glenn's support to the ISP Program continues to grow, which now includes several Glenn technologies and facilities, as well as our analysis and engineering capabilities," said Sandy Reehorst, chief of the Science Projects Office at Glenn. ♦

People



Banks



Brooks



Conley



Dr. Dutta



Franks



Miller



Dr. Zeller

Promotions

Dr. Damodar Ambur was selected chief of the Structure and Acoustics Division. Ambur joins the rank of Senior Executive Service as a strong collaborator in the strategic development of both people and organizations across technology areas and programs. Ambur previously served at Langley for 17 years, where he progressed through the ranks developing a solid technical and management background. These qualifications will help him effectively execute research and technology development activities supporting Glenn's Aeronautics and Space Directorates, as well as the projects managed by program offices at other NASA centers and Headquarters.

Dr. Mary Zeller has been selected chief of the Instrumentation and Controls Division, through the Competitive Placement Process. Zeller formerly served as program manager for the Glennan Microsystems Initiative and associate project manager for Nanotechnology Projects. Since joining Glenn in 1988, she has demonstrated solid technical, management, and leadership skills applied to developing and mentoring a culturally and technically diverse workforce. She also has vast experience working with academic, industrial, and government partners.

Awards & Honors

The Northeast Ohio Technology Coalition (NorTech), in conjunction with JumpStart, Inc., and their sponsors presented a 2004 NorTech Innovation Award to Glenn for the development of a technology that brings works of art back to life. Originally developed to simulate the low-Earth orbital space environment, this technology has made it possible to etch as well as alter the surface chemistry and texture of many materials with atomic oxygen, a low-energy beam of oxygen atoms. **Bruce Banks**, chief, Electro-Physics Branch, and **Sharon Miller**, senior research engineer in the Electro-Physics Branch, codeveloped a technique that applies this technology to successfully restore fire-damaged and defaced paintings that were previously considered beyond repair.

The Glenn chapter of the Business and Professional Women's (BPW) organization awarded its 2004 scholarships to the following Center employees who are currently

enrolled in an accredited program or course of study: **Josephine Franks**, secretary with the Aeropropulsion Research Program Office, received \$400 towards a degree in business management from the Cuyahoga Community College; **Chrystal Brooks**, an InDyne word processor II supporting the Project Management and Quality Assurance Branch, received \$400 towards a business degree from Lorain County Community College; and **Michelle Conley**, a heavy truck driver supporting warehousing of hold storage, Plum Brook Operations Support Group, received \$200 towards a degree in industrial electronics at Terra Community College in Fremont. To learn more about BPW, visit [http://www.grc.nasa.gov/WWW/Clubs/NASA BPW/](http://www.grc.nasa.gov/WWW/Clubs/NASA%20BPW/).

Dr. Sunil Dutta, Office of the Director, was one of three Northeast Ohioans honored with a "Keeping the Dream Alive" award presented by the Ohio Civil Rights Commission. Dutta was recognized for his efforts on behalf of Cleveland's Asian Indian community and as program manager of Glenn's Historically Black Colleges and Other Minority Universities Research Program as well as for Small and Disadvantaged Businesses. ♦

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DEADLINES: News items and brief announcements for publication in the September issue must be received by noon, August 13. The deadline for the October issue is noon, September 9. Submit contributions to the editor via e-mail,

doreen.zudell@grc.nasa.gov, fax 216-433-8143, phone 216-433-5317 or 216-433-2888, or MS 3-11. Ideas for news stories are welcome but will be published as space allows. View us online at <http://AeroSpaceFrontiers.grc.nasa.gov>.



News Notes

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HISPANIC HERITAGE OBSERVANCE:

The Hispanic Advisory Council will host the Center's Hispanic Heritage Month Observance Celebration 2004 with the theme "Hispanic Americans: Making a Difference in our Communities and our Nations." The event will be held Wednesday, September 22, from 9:30 to 11:30 a.m. The location to be determined. Jose C. Feliciano, a prosecutor in the City of Cleveland, will be the keynote speaker.

Savings Bond Drive

The Annual Savings Bond Drive Kickoff will be held on August 13 at 1:30 p.m. in the Ad Building Auditorium. Join host Dennis Pehotsky in welcoming a celebrity guest speaker and a chance to win 1 of 50 door prizes.

Retirements

Leonard Cobbs, Educational Programs Office, retired on July 31, 2004, with 25 years of NASA service.



Cobbs

George Neiner, Aeropropulsion Projects Office, retired on July 2, 2004, with 40 years of NASA service.

In Appreciation

Thank you to our many friends who supported us with kind words at the recent passing of Gary's mother.

—Gary and Pat Halford

In Memory

Warren Moore, 68, who retired in 1993 after 31 years of Federal service, recently died. Moore served as a mechanical engineering technician in the Test Installation Division.

AeroSpace Frontiers earns award of excellence

Glenn's *AeroSpace Frontiers* newsletter has earned an Award for Publication Excellence (APEX) for a third year in a row. Editor Doreen Zudell and Assistant Editor S. Jenise Veris, (IDI) Community and Media Relations Office, with graphic artist Jim Lucic, (IDI) Logistics and Technical Information Division, earned a 2004 APEX. The winning four-page spread, titled "Powering Flight, Powering Dreams," looked back on Glenn's successful year-long commitment to recognizing the 100th anniversary of powered flight.



The editors of *Writing That Works*, *The Business Communications Report*, sponsor the contest. APEX awards are based on excellence in graphic design, editorial content, and the ability to achieve overall communications excellence in print and electronic media. ♦

Behind the Badge

a closer look at our colleagues

David Cotton

Job Assignment: Mechanical engineer technician and preapprentice training instructor in the Prototype Development Branch of the Engineering Development Division.



Time at NASA: I've worked here for 16 years.

Favorite quote: Matthew 6:33 "Keep on, then, seeking first the kingdom and his righteousness, and all these (other) things will be added to you."

Dream job: To own a parts and repair auto service center and to get paid to play golf.

Philosophy to live by: Become the best at what you like and you will be rewarded for it.

Vacation fantasy: Australia for the wonderful people, great food, and shopping.

Stress buster: Activities are good stress relievers: golf, bowling, bike riding, walking, swimming—anything that shifts your mind's focus.

Favorite Web site: CottonGolf.com is a Web site I started to promote and market a patent invention of mine. My products are golf ball and club head washers, which can be carried anywhere on the golf course or practice range by means of a golf towel. I am currently working on other golf-related items and apparel.

Retirees share "lessons learned" on programs

What makes a successful program? Center alumni share their insight.

BY DOREEN B. ZUDELL

Clear objectives and goals, strong leadership, competent teams, and respectful communication among all the organizations involved topped the list of elements that make for a successful program, according to a panel of distinguished Center alumni who gathered at Glenn on June 10.

The panelists, who possess significant experience in managing large programs and organizations, were participating in a workshop sponsored by Glenn's Office of Strategic Management. The event was part of an effort by the Office of Exploration Systems (Code T) to capture significant lessons learned from NASA space flight activity.

Panelists Ronald Thomas, former program manager, Space Station Work Package Four; Richard Gedney, former project manager, Advanced Communications Technology Satellite; John Gibb, former project manager, Expendable Launch Vehicles; and Edwin Muckley, former head, Mission Integration Office, addressed a series of questions relating to

the lessons learned effort. Vern Weyers, former director, Space Flight Systems at Glenn and director, Flight Projects at NASA Goddard, provided written responses to the questions.

Office of Strategic Management Director Randall Furnas, facilitated the workshop, which included a series of questions such as "What did you find most successful in past programs?" "What one thing would you do differently if you could do it over again?" "How can NASA improve its cost and schedule estimates for large programs?"

"We were fortunate to have these four retirees, who have a wealth of knowledge about setting up and running major projects and programs, participate in this activity," Furnas said. "We as an Agency have not established a consistent method for preserving such knowledge. Historically, we would likely assign junior people to work with



Photo by Marvin Smith

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Pictured, left to right, are panelists Muckley, Gibb, Thomas, and Gedney, who candidly shared their experiences as program and project managers.

senior people and hope that some of the knowledge rubs off before the senior people retire. This workshop was an attempt at a more systematic collecting of some of that valuable knowledge so that it can be shared with many leaders-to-be across the Agency."

Editor's note: The June 10 workshop was cut short by an electrical power failure halfway through the session. A continuation of the workshop was held on July 21. Both events were videotaped and are available by contacting Dr. Dan Glover at 216-433-2847. ♦

National Aeronautics and Space Administration

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